

Application No. 10/534,684
Amendment Dated February 13, 2007
Reply to Office Action of November 20, 2006

REMARKS

The Office Action mailed November 20, 2006, has been carefully considered by Applicant. Reconsideration is respectfully requested in view of the foregoing claim amendments and the remarks that follow.

Information Disclosure Statement

Applicant thanks the Examiner for providing acknowledgement of the U.S. and foreign patent documents listed on the Information Disclosure Statement dated May 12, 2005. However, the Examiner has not acknowledged the “non-patent literature documents,” including the cited patent abstracts of Japan. Applicant respectfully requests that the Examiner acknowledge same, or otherwise advise if further information is required.

Allowable Subject Matter

Claim 3 and 6 are indicated as allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. By the present Amendment, claims 3 and 6 are rewritten as new claims 18 and 19 and include all of the limitations of the base claim and any intervening claims.

Claim Objections

Claim 6 has been objected to as failing to provide antecedent basis for the limitation “the piston shoulder”. By the present Amendment, claim 6 is amended to delete the limitation “the piston shoulder”. As such, the objection is believed overcome.

Claim Rejections Under 35 U.S.C. §102

Claims 1, 2, 4 and 5 have been rejected under 35 U.S.C. §102(b) as being anticipated by Bromell et al U.S. Patent No. 4,188,787.

Claim 1

Claim 1 is amended to more particularly point out and distinctly claim the subject matter of the present invention and to render the same allowable over the applied references.

Application No. 10/534,684
Amendment Dated February 13, 2007
Reply to Office Action of November 20, 2006

Claim 1 recites a single-acting hydraulic cylinder having a drainage outlet for leaking fluid, as well as an air inlet. The drainage outlet is connected to a reservoir for collection of leakage fluid. The air inlet is connected with a compressed air reservoir designed to continuously or periodically apply an overpressure to the lower cylinder space.

Bromell et al '787 fails to teach or suggest the claimed air inlet connected to a compressed air reservoir adapted to continuously or periodically apply an overpressure to the lower cylinder space. Bromell et al '787 teaches only a single conduit 110 connected to the cylinder space opposite the rod-side of the cylinder piston. Conduit 110 is for maintaining an equilibrium pressure between cylinder 10 and reservoir 22. The function of conduit 110 is further explained in column 15, lines 6-22, as follows:

As indicated above, most reversible variable displacement hydraulic pumps require a certain input pressure on the input port. Accordingly, the space above the fluid in reservoir 22 is initially pressurized with a compressed gas such as nitrogen, helium or air, depending on the hydraulic fluid used. Since the volume of hydraulic fluid in the reservoir varies, the pressure in the reservoir may vary. As illustrated in the drawing, the space above the hydraulic fluid in reservoir 22 is in communication with the space above the piston 14 in cylinder 10 by way of conduit 110. Thus when hydraulic fluid is withdrawn from reservoir 22 and pumped into the cylinder 10, the increase in gas volume in the reservoir 22 will be substantially identical to the decrease in volume of space above the piston. Accordingly, the piston 14 effectively acts to maintain a relatively constant pressure in the reservoir 22.

As such, there is no teaching or suggestion in Bromell et al '787 of the claimed drainage outlet and air inlet. Bromell et al '787 does not anticipate nor render claim 1 obvious.

The remaining references noted by the Examiner including Hochsattel U.S. Patent No. 4,646,518; Kime U.S. Patent No. 4,707,993; and Smith U.S. Patent No. 5,743,716 also fail to teach or suggest the claimed air inlet connected with a compressed air

Application No. 10/534,684
Amendment Dated February 13, 2007
Reply to Office Action of November 20, 2006

reservoir adapted to continuously or periodically apply an overpressure to the lower cylinder space, per claim 1. This is contrary to the Examiner's conclusions on page 3 of the Office Action.

Hochsattel '518 only teaches a cylinder 1 housing a piston 2 and having a piston-sided cylinder chamber connected to a reservoir. There is no teaching or suggestion or the claimed drainage outlet for leaking fluid and air inlet, per claim 1.

Kime '993 teaches a drain 48 for capturing excess hydraulic fluid that may seep past piston 34. However, Kime '993 fails to teach or suggest the claimed air inlet and compressed air reservoir connected to the air inlet and adapted to continuously or periodically apply an overpressure to the lower cylinder space.

Smith '716 teaches a hydraulic drain 15 connected by a hydraulic fluid drain line 30 to a tank 40. However, there is no teaching or suggestion of the claimed combination, including the drainage outlet and air inlet.

Claims 3, 6 and 7

Claims 3, 6 and 7 depend from claim 1 and are thus believed allowable for the reasons stated above, as well as the subject matter recited therein.

Claim 8

Claim 8 is added and recites a hydraulically actuated piston cylinder device including means for discharging oil from the second chamber that leaked from the first chamber into the second chamber, means for collecting the oil discharged from the second chamber, and means for supplying pressurized air to the second chamber. This arrangement is neither taught nor suggested by the cited references. As such, in accordance with the comments provided above regarding claim 1, claim 8 is believed allowable.

Claims 9-17

Claims 9-17 depend directly or indirectly from claim 8 and are thus believed allowable for the reasons stated above, as well as the subject matter recited therein.

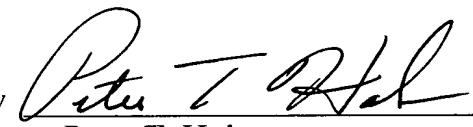
Application No. 10/534,684
Amendment Dated February 13, 2007
Reply to Office Action of November 20, 2006

Conclusion

The present application is thus believed in condition for allowance. Such action is respectfully requested.

Respectfully submitted,

ANDRUS, SCEALES, STARKE & SAWALL, LLP

By 
Peter T. Holsen
Reg. No. 54,180

Andrus, Sceales, Starke & Sawall, LLP
100 East Wisconsin Avenue, Suite 1100
Milwaukee, Wisconsin 53202
Telephone: (414) 271-7590
Facsimile: (414) 271-5770